

# Science + Technology

## IN CONGRESS

February  
2001

### 107th Congress Inherits Key Issues from 106th

As the 107th Congress begins, it may find itself inheriting several important science issues from its predecessor, the 106th Congress. Among the legislation left unfinished and likely to be reintroduced are bills to double research and development (R&D) funding, improve science education, prohibit genetic discrimination, and ensure continued federal support of embryonic stem cell research.

#### R&D Doubling

In the first session of the 106th Congress, the Senate passed by unanimous consent a bill authorizing a doubling of federal funding for nondefense science and technology programs. However the bill, entitled the Federal Research Investment Act and authored by Sen. Bill Frist (R-TN), was blocked in the House by former Science Committee Chairman F. James Sensenbrenner, Jr. (R-WI).

In addition to bipartisan support in the Senate, the effort also received widespread support from scientific societies, universities, and industry groups, and late in the second session, the Senate passed the legislation again by unanimous consent. This time, the bill was packaged with legislation authored by Rep. Sensenbrenner increasing funding for information technology

R&D, but it was once again blocked by Rep. Sensenbrenner, who held that passing broad authorization bills over multiple years would diminish his committee's legislative authority.

However, with Rep. Sherwood Boehlert (R-NY) succeeding Rep. Sensenbrenner as chairman of the Science Committee, the outlook for the bill has improved. Sen. Frist plans to reintroduce it, and Rep. Boehlert has indicated that he might be willing to support it. In a January 31 speech, his first

since assuming the chairmanship, Rep. Boehlert described himself as "kindly disposed" to the doubling bill and said it "might do some real good because it would put Congress on the record as saying that science spending is a real priority." He also expressed a note of caution, however, saying, "We need to ask tough questions ... like: Why double? What are we going to get for that money? How will we know if we are under- or over-spending in any field?" In-

>>> *Continued on page 4*

### Boehlert to Chair Science Committee

As the 107th Congress moves into high gear, some notable alterations within the House and Senate may provide a glimpse into this year's science and technology outlook. Topping the list is the recent appointment of Rep. Sherwood Boehlert (R-NY) as Chairman of the House Science Committee. Rep. Boehlert assumes control of the committee from Rep. F. James Sensenbrenner, Jr. (R-WI), who will now be heading the Judiciary Committee. Members of the scientific community are optimistic about Boehlert's appointment as committee chair owing predominantly to his commitment to the importance of federally funded research and development.

In a recent speech to the Universities Research Association, Rep. Boehlert stated that as chairman he intends to "build the Science Committee into a significant force within the Congress..." He continued by saying that he will seek to "...ensure that we have a healthy, sustainable, and productive R&D establishment — one that educates students, increases human knowledge, strengthens U.S. competitiveness and contributes to the well-being of the nation and the world." Rep. Boehlert, who has represented New York's 23<sup>rd</sup> district for longer than any other representative in that district's history, also stated that he will use

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*"I want to build the Science Committee into a significant force within the Congress."*

—REP. SHERWOOD BOEHLERT (R-NY)

## 107th Congress – Key Senate S&T Committees

### Committee on Appropriations

*S&T Jurisdiction:* Funds all federal departments and agencies.

*Website:* [www.senate.gov/~appropriations](http://www.senate.gov/~appropriations)

*Tel:* 202/224-3471

#### Republicans

*Chairman:*

Ted Stevens, AK

*New Member:*

Michael DeWine, R-OH

*Departing Member:*

Slade Gorton, R-WA

Jon Kyl, R-AZ

*Staff Director:*

Steven J. Cortese

#### Democrats

*Ranking Member:*

Robert C. Byrd, D-WV

*New Members:*

Tim Johnson, D-SD

Mary Landrieu, D-LA

*Departing Member:*

Frank Lautenberg, D-NJ

*Staff Director:*

James H. English

### Committee on Energy and Natural Resources

*S&T Jurisdiction:* Energy production, regulation, and conservation; energy policy; energy R&D.

*Website:* [www.senate.gov/~energy](http://www.senate.gov/~energy)

*Tel:* 202/224-4971

#### Republicans

*Chairman:*

Frank Murkowski, R-AK

*New Members:*

Jon Kyl, R-AZ

Chuck Hagel, R-NE

Richard Shelby, R-AL

*Departing Members:*

Jim Bunning, R-KY

Peter G. Fitzgerald, R-IL

Slade Gorton, R-WA

*Staff Director:*

Brian Malnak

#### Democrats

*Ranking Member:*

Jeff Bingaman, D-NM

*New Members:*

Maria Cantwell, D-WA

Dianne Feinstein, D-CA

Charles Schumer, D-NY

*Departing Members:*

Blanche Lincoln, D-AR

*Staff Director:*

Bob Simon

### Committee on Armed Services

*S&T Jurisdiction:* Department of Defense and military R&D.

*Website:* [www.senate.gov/~armed\\_services](http://www.senate.gov/~armed_services)

*Tel:* 202/224-3871

#### Republicans

*Chairman:*

John Warner, R-VA

*New Members:*

Jim Bunning, R-KY

Susan Collins, R-ME

*Departing Member:*

Olympia Snowe, R-ME

*Staff Director:*

Les Brownlee

#### Democrats

*Ranking Member:*

Carl Levin, D-MI

*New Members:*

Daniel K. Akaka, D-HI

Jean Carnahan, D-MO

Mark Dayton, D-MN

Ben Nelson, D-NE

*Departing Member:*

Bill Nelson, D-FL

*Staff Director:*

Jeff Bingaman, D-NM

Charles Robb, D-VA

*Staff Director:*

David S. Lyles

### Committee on Environment and Public Works

*S&T Jurisdiction:* Environmental policy; environmental R&D; fisheries and wild-life; solid waste disposal and recycling; water resources; pollution; nonmilitary environmental regulation.

*Website:* [www.senate.gov/~epw](http://www.senate.gov/~epw)

*Tel:* 202/224-6176

#### Republicans

*Chairman:*

Robert C. Smith, R-NH

*New Members:*

Ben Nighthorse Campbell, R-CO

Arlen Specter, R-PA

*Departing Members:*

Robert Bennett, R-UT

Kay Bailey Hutchison, R-TX

Craig Thomas, R-WY

*Staff Director:*

David Conover

#### Democrats

*Ranking Member:*

Harry Reid, D-NV

*New Members:*

Thomas R. Carper, D-DE

Hillary Rodham Clinton, D-NY

Jon Corzine, D-NJ

*Departing Members:*

Frank Lautenberg, D-NJ

Daniel Patrick Moynihan, D-NY

*Staff Director:*

J. Thomas Sliter

### Committee on Commerce, Science, and Transportation

*S&T Jurisdiction:* Nonmilitary aeronautical and space sciences, oceans, weather, and atmospheric activities, science, engineering, and technology R&D and policy, standards and measurement.

*Website:* [www.senate.gov/~commerce](http://www.senate.gov/~commerce)

*Tel:* 202/224-5115

#### Republicans

*Chairman:*

John McCain, R-AZ

*New Members:*

George Allen, R-VA

John Insign, R-NV

Peter G. Fitzgerald, R-IL

Gordon Smith, R-OR

*Departing Members:*

Spencer Abraham, R-MI

John Ashcroft, R-MO

Bill Frist, R-TN

Slade Gorton, R-WA

*Staff Director:*

Mark Buse

#### Democrats

*Ranking Member:*

Ernest F. Hollings, D-SC

*New Members:*

Barbara Boxer, D-CA

Jean Carnahan, D-MO

John Edwards, D-NC

*Departing Member:*

Richard H. Bryan, D-NV

*Staff Director:*

Kevin D. Kayes

### Committee on Health, Education, Labor and Pensions

*S&T Jurisdiction:* Education, labor, health, and biomedical R&D.

*Website:* [www.senate.gov/~labor](http://www.senate.gov/~labor)

*Tel:* 202/224-5375

#### Republicans

*Chairman:*

James M. Jeffords, R-VT

*New Members:*

Kit Bond, R-MO

Pat Roberts, R-KS

John Warner, R-VA

*Departing Members:*

Sam Brownback, R-KS

Mike DeWine, R-OH

Chuck Hagel, R-NE

*Staff Director:*

Mark Powden

#### Democrats

*Ranking Member:*

Edward M. Kennedy, D-MA

*New Members:*

Hillary Rodham Clinton, D-NY

John Edwards, D-NC

*Staff Director:*

Michael Myers

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- R&D Budget and Policy Updates – [www.aaas.org/spp/dspp/rd/form.htm](http://www.aaas.org/spp/dspp/rd/form.htm)  
*The latest information on federal R&D funding.*
- Washington Science Policy Alliance (WSPA) – [www.aaas.org/spp/wspa/wspaform.htm](http://www.aaas.org/spp/wspa/wspaform.htm)  
*A coalition of institutions that organizes a periodic seminar series on S&T policy issues.*

AAAS  
NOTES

## 107th Congress – Key House S&T Committees

### Committee on Appropriations

*S&T Jurisdiction:* Funds all federal departments and agencies.

#### Republicans

*Chairman:*

C.W. Bill Young, R-FL

*New Members:*

John Doolittle, R-CA

Ray LaHood, R-IL

John Sweeney, R-NY

David Vitter, R-LA

*Departing Members:*

Jay Dickey, R-AR

Ron Packard, R-CA

John E. Porter, R-IL

*Staff Director:*

James W. Dyer

#### Democrats

*Ranking Member:*

David Obey, D-WI

*New Members:*

James Clyburn, D-SC

Chaka Fattah, D-PA

Patrick J. Kennedy, D-RI

Steven Rothman, D-NJ

*Departing Members:*

Julian C. Dixon, D-CA

Michael P. Forbes, D-NY

*Staff Director:*

Scott Lilly

### Committee on Armed Services

*S&T Jurisdiction:* Department of Defense; scientific research and development in support of the armed services; military R&D.

#### Republicans

*Chairman:*

Bob Stump, R-AZ

*New Members:*

Todd Akin, R-MO

Ken Calvert, R-CA

Andrew Crenshaw, R-FL

Jo Ann Davis, R-VA

Mark Kirk, R-IL

Edward Schrock, R-VA

Robert Simmons, R-CT

Heather Wilson, R-NM

*Departing Members:*

Herbert H. Bateman, R-VA

Mary Bono, R-CA

Stephen Buyer, R-IN

Tillie Fowler, R-FL

John Kasich, R-OH

Steven Kuykendall, R-CA

Joseph Pitts, R-PA

James Talent, R-MO

*Staff Director:*

Robert S. Rangel

#### Democrats

*Ranking Member:*

Ike Skelton, D-MO

*New Members:*

Susan Davis, D-CA

Jim Langevin, D-RI

*Departing Members:*

Patrick J. Kennedy, R-RI

Owen B. Pickett, D-VA

*Staff Director:*

Jim Schweiter

### Committee on Science

*S&T Jurisdiction:* Scientific R&D—energy, aeronautical, civil aviation, environmental; National Institutes of Science and Technology; NASA; National Science Foundation; National Weather Service; science scholarships; national labs; information technology; university research policy, international technology transfer.

#### Republicans

*Chairman:*

Sherwood L. Boehlert, R-NY

*New Members:*

Todd Akin, R-MO

John Culberson, R-TX

Felix J. Grucci, Jr., R-NY

Melissa Hart, R-PA

Timothy Johnson, R-IL

Mike Pence, R-IN

Christopher Shays, R-CT

*Departing Members:*

Kevin Brady, R-TX

Merrill Cook, R-UT

Thomas Ewing, R-IL

Mark Green, R-WI

Steven T. Kuykendall, R-CA

Jack Metcalf, R-WA

Mark Sanford, R-SC

F. James Sensenbrenner, Jr., R-WI

*Staff Director:*

David Goldston

#### Democrats

*Ranking Member:*

Ralph M. Hall, D-TX

*New Members:*

Steve Israel, D-NY

Jim Matheson, D-UT

*Departing Members:*

Michael Capuano, D-MA

Mike Doyle, D-PA

Debbie Stabenow, D-MI

*Staff Director:*

Robert E. Palmer

### Committee on Education and the Workforce

*S&T Jurisdiction:* Education; labor; vocational and job training; school nutritional programs; occupational health and safety.

#### Republicans

*Chairman:*

John A. Boehner, R-OH

*New Members:*

Judy Biggert, R-IL

John Culberson, R-TX

Ric Keller, R-FL

Tom Osborne, R-NE

Todd Platts, R-PA

Patrick Tiberi, R-OH

*Departing Members:*

Bill Barrett, R-NE

Nathan Deal, R-GA

William F. Goodling, R-PA

Matthew G. Martinez, R-CA

David McIntosh, D-IN

Ron Paul, R-TX

Matt Salmon, R-AZ

James Talent, R-MO

*Staff Director:*

Paula Nowakowski

#### Democrats

*Ranking Member:*

George Miller, D-CA

*New Members:*

Susan Davis, D-CA

Betty McCollum, D-MN

Lynn Rivers, D-MI

Hilda Solis, D-CA

*Departing Members:*

William "Bill" Clay, D-MO

Chaka Fattah, D-PA

Carlos Romero-Barceló, D-PR

*Staff Director:*

John Lawrence

### Committee on Energy and Commerce

*S&T Jurisdiction:* Biomedical R&D; public health and health facilities; energy--resources, conservation, policy, nuclear; interstate and foreign telecommunications; Clean Air Act and environmental protection.

#### Republicans

*Chairman:*

W.J. "Billy" Tauzin, R-LA

*New Members:*

Charles Bass, R-NH

Mary Bono, R-CA

Steve Buyer, R-IN

Joseph Pitts, R-PA

George Radanovich, R-CA

Lee Terry, R-NE

Greg Walden, R-OR

*Departing Members:*

Brian Bilbray, R-CA

Thomas J. Bliley, R-VA

Tom Coburn, R-OK

Rick Lazio, R-NY

Michael Oxley, R-OH

James E. Rogan, R-CA

*Staff Director:*

David Marventano

#### Democrats

*Ranking Member:*

John D. Dingell, D-MI

*New Members:*

Mike Doyle, D-PA

Jane Harman, D-CA

Christopher John, D-LA

*Departing Member:*

Ron Klink, D-PA

*Staff Director:*

Reid P.F. Stuntz

### Committee on Resources

*S&T Jurisdiction:* Forest reserves and national parks; geological survey; mineral resources; water resources, irrigation and reclamation; conservation of resources; wildlife resources; marine science and research.

#### Republicans

*Chairman:*

James V. Hansen, R-UT

*New Members:*

Jeff Flake, R-AZ

Scott McInnis, R-CO

Tom Osborne, R-NE

C.L. Otter, R-ID

Dennis R. Rehberg, R-MT

*Departing Members:*

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John Doolittle, R-CA

Helen Chenoweth-Hage, R-ID

Robin Hayes, R-NC

Rick A. Hill, R-MT

*Staff Director:*

Allen Freemyer

#### Democrats

*Ranking Member:*

Nick Rahall, D-WV

*New Members:*

Anibal Acevedo-Vilá, D-PR

Brad Carson, D-OK

Edward J. Markey, D-MA

Betty McCollum, D-MN

Jim McGovern, D-MA

Hilda Solis, D-CA

*Departing Members:*

Joseph Crowley, D-NY

Christopher John, D-LA

Patrick J. Kennedy, D-RI

George Miller, D-CA

Owen B. Pickett, D-VA

Carlos Romero-Barceló, D-PR

Bruce F. Vento, D-MN

*Staff Director:*

Jim Zoia

## 107th Inherits Key Issues

*Continued from page 1*

creased science funding, he continued, is "a case that is going to have to be made agency by agency, as well as in general terms."

Adding momentum to doubling efforts is a January 31 report of the U.S. Commission on National Security/21st Century. Also known as the Hart-Rudman report, the findings include a recommendation to

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*Rep. Boehlert described himself as "kindly disposed" to the doubling bill and said it "might do some real good because it would put Congress on the record as saying that science spending is a real priority."*

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double the federal R&D budget by 2010. "In a knowledge-based future," the report states, "only an America that remains at the cutting edge of science and technology will sustain its current world leadership." But the federal government "has seriously underfunded basic scientific research in recent years."

### Science Education

While President Bush and a group of moderate Senate Democrats have put forth broad, widely publicized proposals for rewriting the Elementary and Secondary Education Act (ESEA), four lesser-known bills that specifically address math and science teaching in grades K-12 have been reintroduced in the House.

Three of the bills (H.R. 100, 101, and 102, formerly H.R. 4271, 4272, and 4273) were originally introduced last April by Rep. Vernon J. Ehlers (R-MI) and are known collectively as the National Science Education Acts. H.R. 100 and 101 would establish new programs at the National Science Foundation and Department of Education placing renewed emphasis on teacher recruitment, retention, mentoring and professional development; H.R. 102 would create a new tax credit for teachers.

The centerpiece of the proposal, H.R. 100, has received bipartisan support and passed the Science Committee unanimously last July, but it failed to pass the full House due to a last-minute disagreement over the eligibility of private schools for funding under the act's "master teacher" grant. According to Rep. Ehlers, H.R. 101 had strong enough support to pass the Committee on Education and the Workforce, but there was not enough time to hold a markup before the end of the session. H.R. 102, which was referred to the Ways and Means Committee, was opposed by the committee's chairman, former Rep. Bill Archer (R-TX).

The three bills were the subject of a series of hearings held last year by the Science and Education and the Workforce Committees that included testimony from Federal Reserve Chairman Alan Greenspan, Alfred R. Berkeley III, the president of NASDAQ, and Craig R. Barrett, the president of Intel.

The remaining bill (H.R. 117, formerly H.R. 5504), which was originally introduced at the end of the last Congress by Reps. Rush Holt (D-NJ) and Connie Morella (R-MD), authorizes grant programs totaling \$5 billion for states to improve the recruitment and retention of math and science teachers. The proposal would implement some of the recommendations contained in a September 2000 report by the National Commission on Mathematics and Science Teaching for the 21st Century, a major national commission chaired by former senator and astronaut John Glenn (D-OH). The bill was introduced on October 19, however, too late for the House to take action on it.

The Hart-Rudman report may help to spur investment in science and math education, as well as in R&D. The report describes a growing need to revitalize science and math education programs. "The quality of the U.S. education system," the report finds, "... has fallen well behind those of scores of other nations. This has occurred at a time when vastly more Americans will have to understand and work competently with science and math on a daily basis."

The report recommends a "National Security and Technology Education Act to fund a comprehensive program to produce

the needed numbers of science and engineering professionals as well as qualified teachers in science and math." The act would include "reduced-interest loans and scholarships for students to pursue degrees in science, mathematics, and engineering; loan forgiveness and scholarships for those in these fields entering government or military service; a National Security Teaching Program to foster science and math teaching at the K-12 level; and increased funding for professional development for science and math teachers."

### Genetic Discrimination

As scientists learn more and more about the human genome, the resulting knowledge is bringing along some ethical baggage. Last summer, Dr. Francis Collins, the director of the National Human Genome Research Institute at the National Institutes of Health (NIH), sounded an alarm about the misuse of genetic test results. "Already, with but a handful of genetic tests in common use, people have lost their jobs, lost their health insurance, and lost their economic well being due to the unfair and inappropriate use of genetic information," he testified before the Senate Committee on

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*While scientists believe that stem cells hold great promise, opponents hold that the destruction of any embryo is morally equivalent to the killing of a human being.*

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Health, Education, Labor, and Pensions.

In response to these concerns, Rep. Louise Slaughter (D-NY) introduced a bill (H.R. 2457) to prohibit employers and insurance companies from discriminating against individuals based on genetic information. No action was taken on the bill, but Rep. Slaughter plans to reintroduce it, and supporters hope that the rising profile of human genome research will improve its

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## CONGRESSIONAL RESEARCH SERVICE

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*Copies of CRS reports for congressional use are available by calling 202/707-7132.*

- **Alternative Transportation Fuels and Vehicles: Energy, Environment, and Development Issues (RL30758)**  
This report explores numerous Alternative Fuel Vehicle (AFV) technologies and addresses critical issues associated with each. Evaluations of cost, fuel consumption, performance, infrastructure and safety are performed on a fuel-specific basis. Also included is a brief legislative background.
- **Voting Technologies in the United States (RL30773)**  
This report examines the various voting technologies used in the United States today as well as issues pertaining to their efficacy. Issues explored include: ballot design, prevention and correction of voter error, vote counting, standardization, and voting system upgrades.
- **StarLink™ Corn Controversy: Background (RS20732)**  
This report addresses the issue of genetically modified (GM) products entering the food chain by examining the StarLink™ Corn controversy. The report focuses on the evolution of the case and comments upon the current governmental review process for GM foods. Included are the EPA's StarLink™ regulatory timeline as well as a short primer on genetic testing methods.
- **Environmental Protection: New Approaches (RL30760)**  
This report summarizes briefly a number of "new approaches" to environmental protection. Included are: information-based approaches; public sector processes; incentive programs; market mechanisms; and management principles. The report also includes a comprehensive appendix of further reading on the subject of environmental protection.
- **Patent Law and Its Application to the Pharmaceutical Industry: An Examination of the Drug Price Competition and Patent Term Restoration Act of 1984 (RL30756)**  
This report provides an analysis of patent law as it relates to the current state of the pharmaceutical industry. The report examines both the etiology and current viability of this act, which is also known as the "Hatch-Waxman Act." Included is a brief introduction to patent formulation and enforcement.

## GENERAL ACCOUNTING OFFICE

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*Copies of GAO Publications are available online at [www.gao.gov](http://www.gao.gov) or by calling 202/512-6000.*

- **Export Controls: System for Controlling Export of High Performance Computing is Ineffective (GAO-01-10)**  
This report examines the current state of export restrictions on high performance computing. The report concludes that the current export control system is ineffective, as it does not address the ability to cluster slower computers into high

performance computers. Further, the report indicates that Millions of Theoretical Operations Per Second (MTOPS), the convention currently used to establish export thresholds, is no longer a valid measure of computing performance.

- **Nuclear Weapons: Improved Management Needed to Implement Stockpile Stewardship Program Effectively (GAO-01-48)**  
This report addresses the Department of Energy's (DOE) management of its National Nuclear Security Administration's Stockpile Stewardship Program. The report highlights deficiencies within the administration's approach to planning and budget formulation, as well as to organizational and leadership structure within the program. Management and experience within the department's Stockpile Life Extension Program is also addressed.

## THE NATIONAL ACADEMIES

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*Government offices may obtain single complimentary copies by calling the Office of Congressional and Government Affairs at 202/334-1513. Others may order copies from the National Academy Press (800/624-6242, [www.nap.edu](http://www.nap.edu)).*

- **Astronomy and Astrophysics in the New Millennium (ISBN: 0-309-07031-7)**  
This book provides various recommendations for the nation's programs in astronomy and astrophysics. Areas covered include the role of federal research agencies, allocation of funding, training for scientists, competition and collaboration among space facilities, and more. The authors also explore the role that emerging information technologies will play in helping scientists to make sense of the wealth of data currently available, as well as how to integrate astronomical discoveries into the educational system and national life.
- **Carving our Destiny: Scientific Research Faces a New Millennium (ISBN: 0-309-06848-7)**  
This book examines contemporary research frontiers by addressing questions such as: Is the human mind truly unique among primates? Does "dark matter" truly exist in the universe? What can the human genome tell us about our evolutionary history? The book includes articles by ten young scientists and scholars and covers a wide range of topics which have an impact on our understanding of ourselves.
- **Vaccines for the 21<sup>st</sup> Century: A Tool for Decisionmaking (ISBN: 0-309-05646-2)**  
Produced by the Institute of Medicine, this volume examines issues related to vaccine development over the coming decades. Approaches for comparing potential vaccines on the basis of their impact and morbidity/mortality is discussed incorporating both health care and vaccine development costs. The authors also provide an analytic framework and quantitative model for evaluating disease conditions.

# scientific definitions

1. The act of making clear and distinct.
2. the act of stating a precise meaning or significance.

## NANOTECHNOLOGY TERMS

**NANO-** From the Greek word *nanos*, meaning "dwarf," the prefix nano is used in the metric system to mean  $10^{-9}$  or one billionth (1/1,000,000,000). Thus, a nanometer is  $10^{-9}$  or one billionth of a meter, a nanojoule is  $10^{-9}$  or one billionth of a joule, etc.

**NANOTECHNOLOGY** Areas of technology where dimensions and tolerances in the range of 0.1 to 100 nanometers play a critical role. This includes objects designed and built by manipulating each separate atom or molecule.

**BULK TECHNOLOGY** Technology in which atoms and molecules are manipulated in bulk, rather than individually. All forms of manufacturing in use today may be considered bulk technologies.

**MOLECULAR MANUFACTURING** Manufacturing in which atoms and molecules are manipulated individually, rather than in bulk.

**BIOMIMETIC** Imitating, copying, or learning from nature. Nanotechnologies already exist in nature; thus, nanoscientists have a wide variety of components and tricks already available.

**NANOMACHINES** A mechanical device so small that its parts are single molecules. While nanomachines abound in nature, nanotechnology seeks to understand how they work and build them synthetically for technological use.

**IMMUNE MACHINES** Theoretical medical nanomachines designed for internal use, especially in the bloodstream and digestive tract, able to identify and disable intruders such as bacteria and viruses.

**MOLECULAR SURGERY** Analysis and physical correction of molecular structures in the body using medical nanomachines.

**ASSEMBLER** A nanorobot capable of assembling nanomachines by selectively positioning their components. Though many people are trying, to date no assembler has been built. However, many designs for various nanomachines have been made in hopes that once the assembler is built it will be able to assemble them.

**MEMS** Micro-electromechanical systems (also known simply as microsystems) combine electronics with microscale mechanical devices, resulting in microscopic machinery. Nano-Electro-Mechanical Systems (NEMS) are orders of magnitude smaller and are one of the goals of nanotechnology.

**NANOTUBES** Nanoscale tubes discovered in 1991 by Sumio Iijima that resemble rolled up graphite. Depending on the direction that the tubes are rolled, they can act either as conductors, semiconductors or insulators. Furthermore, their strength and flexibility makes them prime candidates for components in nanomachines.

SOURCE: <http://nanotech.about.com/science/nanotech/>

## 107th Inherits Key Issues

*Continued from page 4*

prospects. Senate Minority Leader Tom Daschle (D-SD) introduced a similar bill in the Senate (S. 1322) that also failed to move forward. He also offered a similar proposal as an amendment to the Labor, Health and Human Services, Education appropriations bill, but it failed along party lines.

### Stem Cells

One of the most emotionally charged issues to come up in the last Congress was that of federal funding for embryonic stem cell research. This area of research is a newly developing field that involves the derivation of stem cells from human embryos. These cells are undifferentiated, which means that they have the ability to grow into nearly any type of tissue in the human body.

While scientists believe that such cells hold great promise for the treatment of diseases such as Parkinson's and diabetes, critics object to the research because it involves the destruction of human embryos. Proponents of the research point to the fact that the embryos used would come from fertility clinics that planned to destroy them anyway, but opponents hold that the destruction of any embryo is morally equivalent to the killing of a human being.

While the NIH announced late last summer that it would begin funding embryonic stem cell research, President Bush has asked the Department of Health and Human Services, which houses NIH, to study the issue, and he may consider reversing the decision. Sens. Arlen Specter (R-PA) and Tom Harkin (D-IA), the chairman and ranking member of the Senate Appropriations Labor-HHS Subcommittee, which funds NIH, plan to reintroduce legislation (S. 2015 in the 106th Congress) that would explicitly provide for federal funding of the research. ●●●

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#### FOR MORE INFORMATION:

*Hart-Rudman Report:*

[www.nssg.gov/phaseIIIwoc.pdf](http://www.nssg.gov/phaseIIIwoc.pdf)

*Glenn Commission Report:* [www.ed.gov/americaaccounts/glenn/toc.html](http://www.ed.gov/americaaccounts/glenn/toc.html)

*AAAS Stem Cell Report:* [www.aaas.org/spp/dspp/sfrr/projects/stem/main.htm](http://www.aaas.org/spp/dspp/sfrr/projects/stem/main.htm)

## Boehlert to Chair Science Committee

*Continued from page 1*

his chairmanship to "...increase research funding, in general, and funding for the physical sciences, in particular."

In the same speech, Rep. Boehlert outlined his top three initial priorities for the Science Committee, the first of which is addressing deficiencies within primary and secondary level science and mathematics education. Second on Rep. Boehlert's list is energy policy. More specifically, he intends to focus on alternative sources of energy and on conservation and efficiency. Finally, in keeping with his reputation as one of the GOP's top environmental legislators, Boehlert will make the environment another of the committee's top priorities.

Rep. Boehlert maintained his commitment to the importance of federal support for research and development by saying that he is "kindly disposed" to the idea of doubling federal R&D across all scientific disciplines. However, he went on to say that across-the-board research doubling would be a difficult goal to meet without clear data suggesting specific areas of need.

Also of extreme importance to Rep. Boehlert is the burgeoning research-based relationship between universities and industry. According to Rep. Boehlert, "That partnership, encouraged by legislation, is having many beneficial effects. But it's time we make sure that we understand better how it's affecting the university." The Committee will examine such issues as the free flow of information, the nature of university research, and the development of intellectual property.

Finally, as chairman, Rep. Boehlert says that he will not hesitate to "ask tough and uncomfortable questions to ensure that the scientific community is acting in its and the nation's long-term interests." At the same time, however, he said that he will work hard to be the science community's "staunchest ally and fairest critic."

To that end, he will undoubtedly look for support from the the recently re-organized subcommittee structure of the Science Committee. Although the committee will continue to have four subcommittees, some names and jurisdictions have been changed.

The Subcommittee on Research, formerly known as the Subcommittee on Basic Research, remains virtually unchanged, and will continue to oversee the National Science Foundation (NSF) as well as other general issues relating to federal science funding and academic research.

The Subcommittee on Space and Aeronautics will continue to oversee the National Aeronautics and Space Agency (NASA), but will also oversee research issues of the Federal Aviation Administration (FAA), formerly under the jurisdiction of the Subcommittee on Technology.

A newly created Subcommittee on Environment, Technology, and Standards will oversee the Environmental Protection Agency (EPA), the National Oceanographic and Atmospheric Administration (NOAA) and the National Institute of Standards and Technology (NIST).

Finally, the Subcommittee on Energy will have jurisdiction over the Department of Energy. Describing the new subcommittee structure, Rep. Boehlert stated, "This subcommittee structure will enable us to focus on the Committee priorities of education, energy and environment. We have an extraordinarily strong and stable staff and I look forward to getting underway."

In other news relevant to the science community, the battle between Rep. Billy Tauzin (R-LA) and Rep. Michael Oxley (R-OH) over chairmanship of the House Commerce Committee has ended with Rep. Tauzin as chairman of the newly named Committee on Energy and Commerce. Rep. Tauzin replaces Rep. Thomas Bliley (R-VA)

as chairman of the committee whose jurisdiction includes biomedical research and development, regulation of the domestic nuclear energy industry, and formulation of national energy policy. Rep. Oxley is now chairman of the House Financial Services Committee.

Standing out among science-related changes within the Senate was the decision of Sen. Bill Frist (R-TN) to resign his position as chairman of the Commerce Committee's Science, Technology, and Space Subcommittee. Sen. Frist, a cardiac surgeon and committed advocate of science and technology (S&T) issues in Congress, has decided to test his fund-raising prowess by becoming chairman of the National Republican Senatorial Committee. When asked to comment on the reasoning behind this decision, Sen. Frist's communications director stated that he "left the Commerce Committee due to time constraints." However, Sen. Frist still intends to re-introduce his doubling bill and will maintain his ties to S&T by retaining his position as chairman of the Science and Technology Caucus, as well as of the Public Health Subcommittee of the Committee on Health, Education, Labor, and Pensions. Sen. Sam Brownback (R-KS) will take over for Sen. Frist as chairman of the Science, Technology, and Space Subcommittee.

Although no leadership changes occurred at the top of either the Senate Committee on Health, Education, Labor and Pensions, or the Committee on Commerce, Science, and Transportation, numerous changes to the rosters of the two committees will undoubtedly affect the shape of this year's R&D legislation (see table on page 2). ●●●

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### FOR MORE INFORMATION:

*Chairman Boehlert's speech:*

[www.house.gov/boehlert/uraspeech.htm](http://www.house.gov/boehlert/uraspeech.htm)

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## Heard off the Hill

**Wooden Toe** • German researchers have reported the discovery of what may be the oldest known prosthesis on the foot of a mummy from Thebes. The wooden

prosthesis was designed to take the place of the big toe, which the researchers believe may have been amputated due to circulation problems. Artfully crafted, the toe was complete with a carved toenail and was firmly attached to the foot with leather thongs. While Egyptians often fitted their dead with prostheses of missing body parts to equip them for the afterlife, the wear on the bottom of this toe suggests that it got plenty of use during life.

---> *Science, January 12, 2001*

**Glow-in-the-Dark Monkeys** • In yet another controversial biomedical breakthrough, scientists at the Oregon Regional Primate Research Center in Beaverton have created the first genetically modified primate. Named ANDi, which stands for inserted DNA spelled backwards, this monkey is the sole survivor of over 222 gene-altered eggs infused with a luminescent jellyfish gene. Although ANDi doesn't actually glow, the inserted jellyfish genes were found in cells throughout his body, providing hope to scientists in search of customized medical research primates. However, animal rights advocates see ANDi as yet another step down an increasingly slippery slope towards "tailor made" human beings.

---> *Science, January 12, 2001*

**Light Stops** • Time may march on forever, but physicists have found a way to bring light to a grinding halt. In a vacuum, light travels at the brisk pace of 670 million miles per hour. However, in most other materials, it travels slightly slower, and in a few it travels much slower. Now, scientists have found a medium that can absorb a light pulse completely and then reemit it exactly as it originally existed. The medium, a gas of sodium atoms, causes a light pulse to slow down and shrink, much like a stretched-out Slinky dropped into a tank of molasses. Then, by making the medium opaque to the light, the pulse can be stopped completely, and the information it stores transferred to the sodium atoms. After a short period of time, the pulse can then be regenerated exactly as it was before. Scientists hope to be able to use this discovery in the field of quantum computing.

---> *Science, January 26, 2001*

**Dreams of a Rat Race** • Scientist Matthew A. Wilson of the Massachusetts Institute of Technology has discovered that rats dream, suggesting that perhaps we've been underestimating our animal friends. Dr. Wilson ran a series of experiments designed to isolate and record highly specific neural patterns in rats found only when they ran a maze, and then found those same patterns in rats as they entered the dream state known as REM sleep. The findings suggest that the rats were experiencing and reinforcing the memory of the maze much as we humans experience memories of events during our day.

---> *Washington Post, January 25, 2001*